

Use the diagram of the parallelogram to the right to answer the following questions.

1. If  $m\angle MPO = 122^\circ$ , then  $m\angle PON =$  \_\_\_\_\_.

2. If  $m\angle PMN = 74^\circ$ , then  $m\angle NOP =$  \_\_\_\_\_.

3. If  $m\angle 4 = 36^\circ$ , then  $m\angle$  \_\_\_\_\_  $= 36^\circ$ .

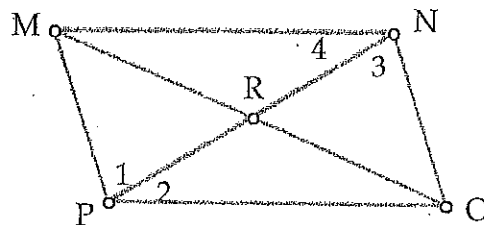
4. If  $m\angle MNO = 106^\circ$  and  $m\angle 4 = 47^\circ$ ,  
then  $m\angle 3 =$  \_\_\_\_\_.

5. If  $NR = 3x + 2$  and  $RP = x + 14$ , then  
 $x =$  \_\_\_\_\_,  $NR =$  \_\_\_\_\_ and  $NP =$  \_\_\_\_\_.

6. If  $MR = 2x + 4$  and  $MO = 7x - 28$ , then  
 $x =$  \_\_\_\_\_,  $RO =$  \_\_\_\_\_ and  $MO =$  \_\_\_\_\_.

7. If  $m\angle PMN = 8x - 5$  and  $m\angle PON = 4x + 19$ , then  
 $x =$  \_\_\_\_\_,  $m\angle PMN =$  \_\_\_\_\_ and  $m\angle MNO =$  \_\_\_\_\_.

8. If  $m\angle MPO = 9x + 2$  and  $m\angle PON = 5x + 10$ , then  
 $x =$  \_\_\_\_\_,  $m\angle MPO =$  \_\_\_\_\_,  
 $m\angle PON =$  \_\_\_\_\_, and  $m\angle PMN =$  \_\_\_\_\_.



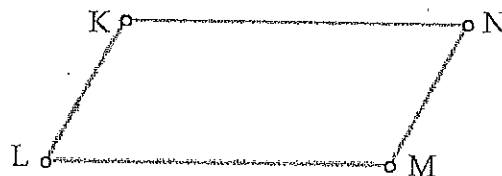
Complete each statement using parallelogram KLMN.

9. If  $KN = 3x - 5$  and  $LM = x + 9$ ,  
then  $KN =$  \_\_\_\_\_.

10. If  $KL = \frac{x}{2}$  and  $MN = 2x - 9$ ,  
then  $KL =$  \_\_\_\_\_.

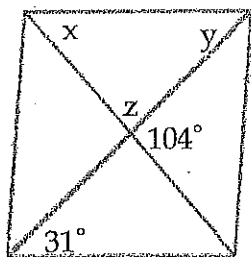
11. If  $m\angle L = 4x + 11$  and  $m\angle K = 6x - 1$ ,  
then  $m\angle K =$  \_\_\_\_\_.

12. If  $m\angle L = x + 40$  and  $m\angle N = 3x - 6$ ,  
then  $m\angle L =$  \_\_\_\_\_.



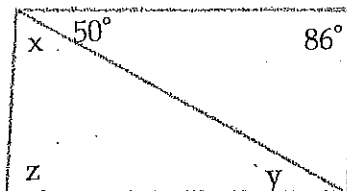
Find the values of  $x$ ,  $y$  and  $z$  if each quadrilateral is a parallelogram.

13.



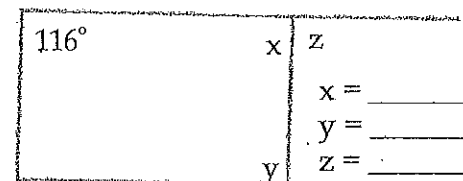
$x =$  \_\_\_\_\_  
 $y =$  \_\_\_\_\_  
 $z =$  \_\_\_\_\_

14.



$x =$  \_\_\_\_\_  
 $y =$  \_\_\_\_\_  
 $z =$  \_\_\_\_\_

15.

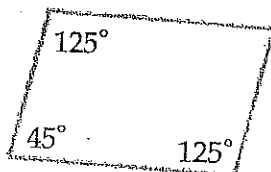


$x =$  \_\_\_\_\_  
 $y =$  \_\_\_\_\_  
 $z =$  \_\_\_\_\_

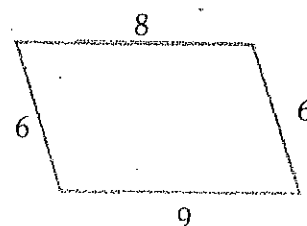
16. In parallelogram WXYZ, if  $m\angle W = 3p$  and  $m\angle X = 4p + 33$ , find  $p$  and the measure of all four angles.

Explain why it is impossible for each figure to be a parallelogram.

17.



18.



19. Quad TRAP has vertices  $T(-2, -1)$ ,  $R(2, 3)$ ,  $A(7, 3)$ , and  $P(3, -1)$ . Is TRAP also a parallelogram? Explain why or why not?